

Claims

1. A retardation element characterized in that a liquid crystalline or non liquid crystalline polymer thin film layer having photoactive groups, subjected to photo orientation treatment is formed on a substrate, and a birefringence layer oriented in a micropattern form is formed so as to contact with said polymer thin film layer.
2. The retardation element according to Claim 1, wherein the photoactive group is at least one group selected from a group consisting of non-aromatic N=N, non-aromatic C=C and non-aromatic C=N.
3. The retardation element according to Claim 1 or 2, wherein the liquid crystalline polymer thin film layer is a thin film layer consisting of a polyamide resin, a polyimide resin, a polyester resin, a polyurethane resin, or a polyvinyl cinnamate resin.
4. The retardation element according to Claim 1 or 2, wherein the non liquid crystalline polymer thin film layer is a thin film layer consisting of polymethacryloyl(acryloyl) oxymethoxycarbonyloxyethylazobenzene.
5. The retardation element according to any one of Claims 1 to 4, characterized in that the birefringence layer oriented in a micropattern form is a birefringence layer oriented with birefringence molecules in a micropattern form.
6. The retardation element according to Claim 5, wherein the birefringence molecule is nematic liquid crystal having thermotropic liquid crystalline property.
7. The retardation element according to Claim 5, wherein the birefringence layer is a lyotropic liquid crystalline

substance.

8. A method for producing a retardation element, characterized by forming a liquid crystalline or non liquid crystalline polymer thin film layer having photoactive groups on a substrate, and then, after irradiation of linear polarized light to said polymer thin film layer, forming a birefringence layer oriented in a micropattern form on said polymer thin film layer.

9. The method for producing a retardation element according to Claim 8, characterized in that the photoactive group is at least one group selected from a group consisting of non-aromatic $N=N$, non-aromatic $C=C$ and non-aromatic $C=N$.

10. The method for producing a retardation element according to Claim 8 or 9, wherein the liquid crystalline or polymer thin film layer is a thin film layer consisting of a polyamide resin, a polyimide resin, a polyester resin, a polyurethane resin, or a polyvinyl cinnamate resin.

11. The method for producing a retardation element according to any one of Claims 8 to 10, characterized in that the non liquid crystalline polymer thin film layer is a thin film layer consisting of polymethacryloyl(acryloyl) oxymethoxycarbonyloxyethylazobenzene.

12. The method for producing a retardation element according to any one of Claims 8 to 11, characterized in that formation of the birefringence layer orientated in a micropattern form is formation of birefringence molecules orientated in a micropattern form.

13. The method for producing a retardation element according to Claim 12, characterized in that the birefringence

molecule is nematic liquid crystal having thermotropic liquid crystalline property.

14. The method for producing a retardation element according to Claim 12, wherein the birefringence layer is a lyotropic liquid crystalline substance.

15. The method for producing a retardation element according to any one of Claims 8 to 14, characterized in that linear polarized light is obtained for said polymer thin film layer through a mask with a micropattern form.

16. A method for producing a retardation element, characterized by forming a liquid crystalline or non liquid crystalline polymer thin film layer having photoactive groups on a substrate, irradiating linear polarized light to said polymer thin film layer, through a mask with a micropattern form, then by irradiating linear polarized light having a different polarizing axis through a mask with a different micropattern form, and thereby forming a birefringence layer consisting of birefringence molecules, on said polymer thin film layer and orienting said birefringence molecules in a micropattern form.

17. A method for producing a retardation element according to Claim 16, wherein the photoactive group is at least one group selected from a group consisting of non-aromatic $N=N$, non-aromatic $C=C$ and non-aromatic $C=N$.

18. The method for producing a retardation element according to Claim 15 or 16, wherein the liquid crystalline polymer thin film layer is a thin film layer consisting of a polyamide resin, a polyimide resin, a polyester resin, a polyurethane resin, or a polyvinyl cinnamate resin.

19. The method for producing a retardation element according to Claim 15 or 16, wherein the liquid crystalline polymer thin film layer is a thin film layer consisting of polymethacryloyl(acryloyl)oxymethoxycarbonyloxyethylazobenzene.

20. The method for producing a retardation element according to Claim 16, characterized in that irradiation of the linear polarized light is carried out by irradiation of laser light having polarized light property.

21. A three-dimensional display, which is a liquid crystal display, wherein at least one of opposing upper and lower substrates is a substrate having a retardation element according to any one of Claims 1 to 7.